

CLAIMS

1. A high strength low shrinkage polyester drawn yarn, which is prepared by melting and extruding a solid state polymerization chip of polyethylene terephthalate at a spinning temperature of 273 to 295°C and drawing the melt and extruded polymer, wherein the high strength low shrinkage polyester drawn yarn has a thermal relaxation stress change ratio of 5 to 100% and a thermal relaxation stress area ratio of 50 to 140% on a thermal relaxation and shrinkage stress curve with a final temperature set to 170°C.

2. The polyester drawn yarn of claim 1, wherein the thermal stress measured under an initial load of 0.11g/d at 170°C is 0.015 to 0.065g/d.

3. The polyester drawn yarn of claim 1, wherein the thermal stress measured under an initial load of 0.01g/d at 170°C is 0.003 to 0.015g/d.

4. The polyester drawn yarn of claim 1, wherein the average value of shrinkage stress measured at 170°C is 0.02 to 0.10g/d.

5. The polyester drawn yarn of claim 1, wherein the thermal

stress measured under an initial load of 0.11g/d at 150°C is 0.015 to 0.065g/d.

6. The polyester drawn yarn of claim 1, wherein the thermal  
5 stress measured under an initial load of 0.01g/d at 150°C is 0.003 to 0.015g/d.

7. The polyester drawn yarn of claim 1, wherein the average  
shrinkage stress measured at 150°C is 0.02 to 0.10g/d.  
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8. The polyester drawn yarn of claim 1, wherein the birefringence  
( $\Delta n$ ) of the polyester drawn yarn is 0.1800 to 0.2200.

9. The polyester drawn yarn of claim 1, wherein the crystallinity  
15 ( $X_c$ ) of the polyester drawn yarn is 44.0 to 55.0%.

10. The polyester drawn yarn of claim 1, wherein the amorphous  
orientation degree ( $f_a$ ) of the polyester drawn yarn is 0.45 to 0.85.

20 11. The polyester drawn yarn of claim 1, wherein the crystal  
orientation degree ( $f_c$ ) of the polyester drawn yarn is 0.905 to 0.945.

12. The polyester drawn yarn of claim 1, wherein the shrinkage is

0.10 to 1.60% under an initial load of 0.01g/d at the measuring condition of 170°C×2minutes.

13. The polyester drawn yarn of claim 1, wherein the shrinkage is  
5 0 to -1.5% under an initial load of 0.10g/d at the measuring condition of 170°C×2minutes.

14. A process for producing a high strength low shrinkage polyester drawn yarn by a direct spin draw process in which a  
10 quenching delay region I having a vertical array of a hood heater 2 and an insulating board 3 is mounted between a spinneret 1 and a quenching chamber 4, wherein the high strength low shrinkage polyester drawn yarn is produced in such methods that a spinning oil is attached to the yarn being spun with an oiling apparatus 8 mounted at  
15 the position 500 to 1,500mm below from the lower bottom surface of the insulating board 3, the relaxation stress of the yarn is controlled with one or two tension guides 9 mounted between Godet rollers of a relaxation region III, or both oiling apparatus 8 and tension guides 9 are mounted.

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15. The process of claim 14, wherein the temperature of the hood heater 2 is 250 to 350°C and the length thereof is 200 to 400mm.

16. The process of claim 14, wherein the length of the insulating board 3 is 60 to 300mm.

17. The process of claim 14, wherein the yarn detention time in the quenching delay region I is 0.02 to 0.08 seconds.

18. The process of claim 14, wherein the spinning tension is less than 0.3g/d.

19. A fabric produced by using the high strength low shrinkage polyester drawn yarn of claim 1.

20. A polyvinyl chloride (PVC) coating fabric produced by using the high strength low shrinkage polyester drawn yarn of claim 1.